Structure and its declaration

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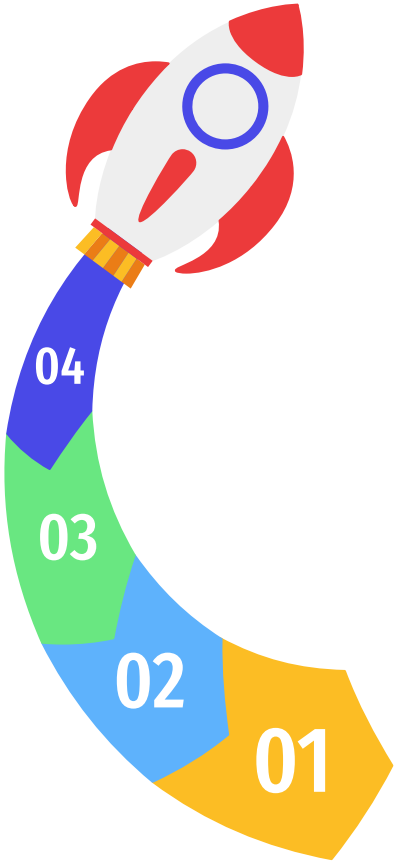


Code

Code output and the final code.

Algorithm

Algorithm design and major steps involved.

Approach

The rough sketch of how to step towards solution.

Introduction

Problem Statement and basic idea behind it.

Introduction

Problem Statement

Declare the C structures for the given scenario:

1

College contains the following fields:
College code (2characters), College Name, year of establishment, number of courses.

2

Each course is associated with course name (String), duration, number of students.
(A College can offer 1 to 50 such courses)

“

We have to declare two seperate Structures for *College Details* and *Course Details*. Elements or Members of

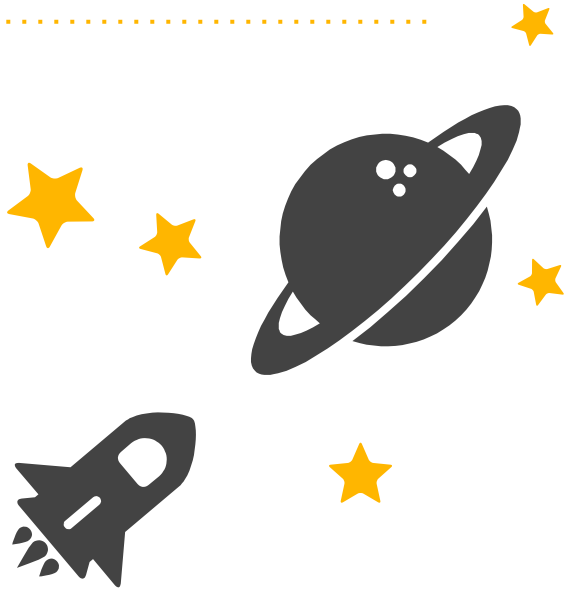
1] First structure:College code, college name, established year and number of courses in college.
2] Second structure:Course name,course duration and number of students in course.

Approach

We will divide the problem in **TWO Main** parts :

Declaration of Structures seperately and declaring the elements (Members) of individual Structures and after declaration of Structures declaring the specific Structure type variable.
Taking user inputs for details by accessing the specific Structure members by using the syntax “variable.member name” and printing output.

Algorithm



Algorithm design and major steps involved....

Structure Declaration

Declaring first Structure with tag ‘college’ which is “struct college”....

Then declaring its members :

- college_code (char array)
- college_name (char array)
- college_estyear (char array)
- number_courses (int datatype)

Declaring second Structure which is “struct course_details”....

Then declaring its members :

- course_name (char array)
- course_duration (float)
- number_of_student (int)

CODE Snippets

```
struct college {

    char college_code [3];
    char college_name [100];
    char college_estyear [5];
    int number_courses;

};
```

```
struct course_details{

    char course_name[100];
    float course_duration;
    int number_of_student;

};
```

Variable declaration

For first Structure “struct college”,declaring variable “entry1 ” and taking user inputs for college details....

```
int main(){

    struct college entry1;
    printf("Enter college code:\n");
    gets(entry1.college_code);
    printf("\n");
```

We will first store the value of number of courses in a new integer type variable “temp” ...

For the second Structure “struct course_details”, declaring array type variable “storing_data[temp]” and taking user inputs for course details....

```
int temp=entry1.number_courses;


struct course_details storing_data[temp];
```

Input and Output

For input and output we have used different for loops...
Both of which iterates 'temp' times which is equal to number of course.

```
for(int i=0;i<temp;i++)
{
printf("Enter course %d name:\n",i+1);
getchar();
gets(storing_data[i].course_name);
printf("\n");


.
.
 //Printf and scanf statements....
.
.
.


}
```

Input part (similar for output one)...

Code output....

For following input the output is----->

Enter college code:IA
Enter college name: IIIT ALLAHABAD
Enter establishment year of college:1987
Enter no. of courses:2

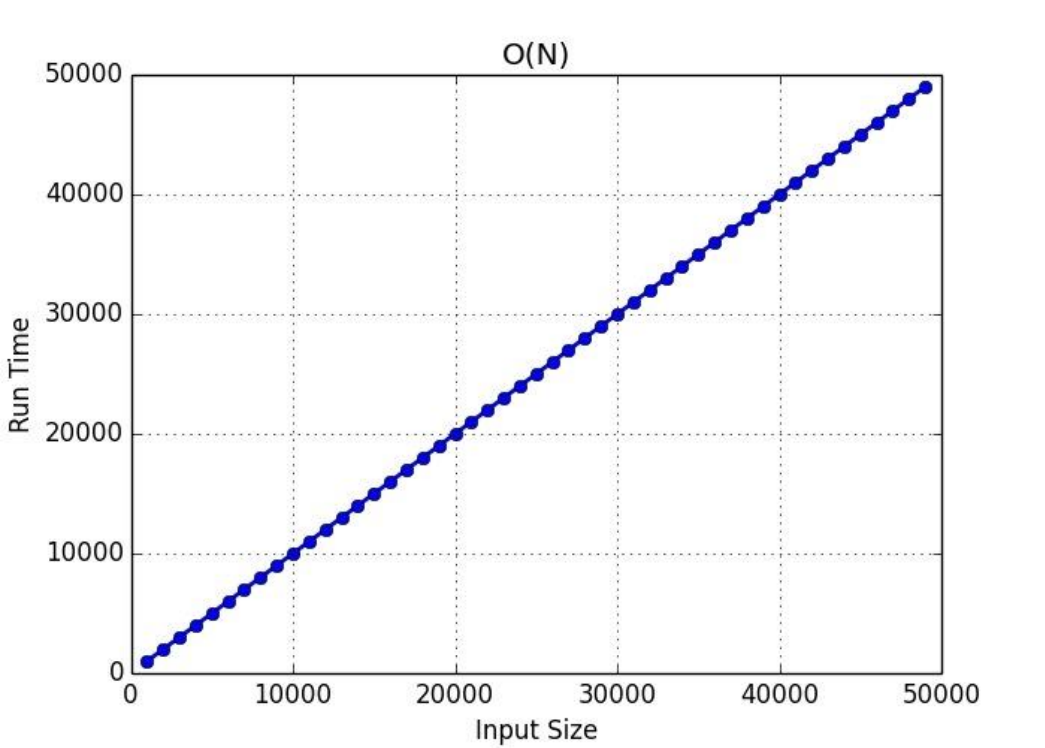
Enter course name: COMPUTER SCIENCE
Enter course duration:4(in yrs)
Enter no.of students in course:200
Enter course name: ECE
Enter course duration:4(in yrs)
Enter no.of students in course:150

```
            ***COLLEGE DETAILS***

College code :IA

College name :IIIT ALLAHABAD

Year of establishement :1987

Number of courses in college :2

            ***COURSE DETAILS***

1]
Course name :COMPUTER SCIENCE
Course duration :4.0
Number of students :200

 2]
Course name :ECE
Course duration :4.0
Number of students :150
```

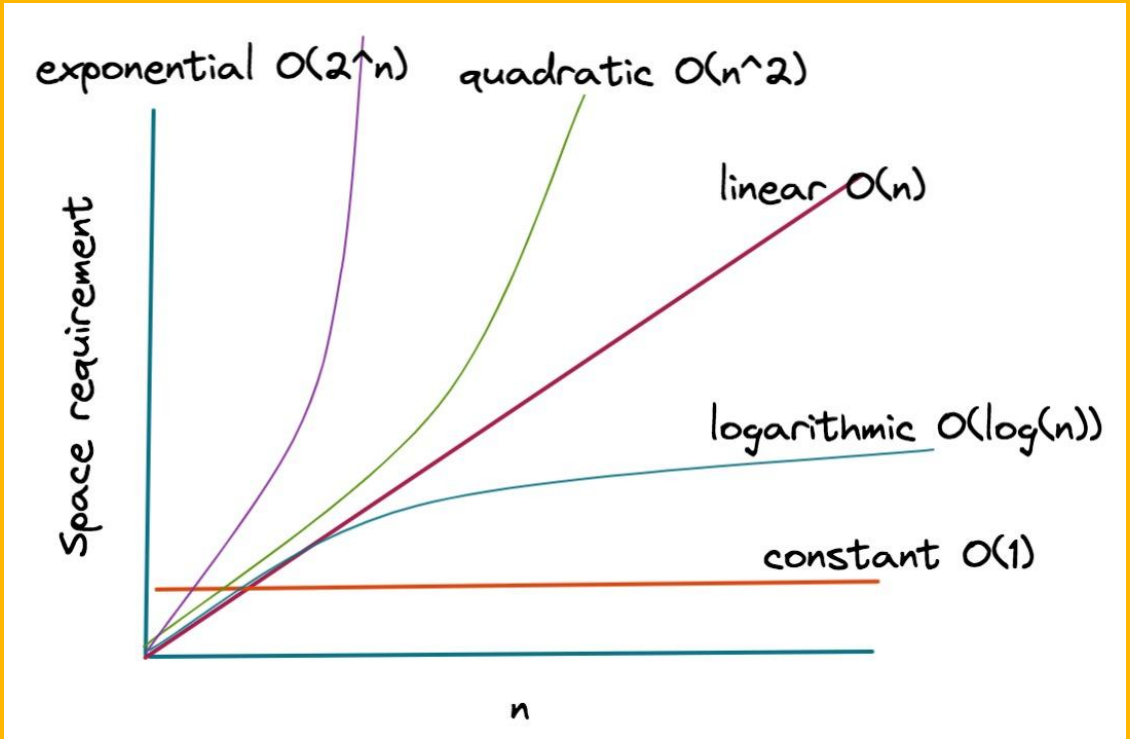
Final Code

```c
#include <stdio.h>

struct college {

    char college_code [3];
    char college_name [100];
    char college_estyear [5];
    int number_courses;

};

struct course_details{

    char course_name[100];
    float course_duration;
    int number_of_student;

};

int main(){

    struct college entry1;
    printf("Enter college code:\n");
    gets(entry1.college_code);
    printf("\n");

    printf("Enter college name:\n");
    gets(entry1.college_name);
    printf("\n");

    printf("Enter establishement year of college:\n");
    gets(entry1.college_estyear);
    printf("\n");

    printf("Enter number of courses:\n");
    scanf("%d",&entry1.number_courses);
    printf("\n");


/***************part 2 input****************/

    int temp=entry1.number_courses;

    struct course_details storing_data[temp];
    for(int i=0;i<temp;i++)
    {
    printf("Enter course %d name:\n",i+1);
    getchar();
    gets(storing_data[i].course_name);
    printf("\n");
    printf("Enter course %d duration in years:\n",i+1);
   scanf("%f",&storing_data[i].course_duration);
    printf("\n");
    printf("Enter number of students in course %d:\n",i+1);
 scanf("%d",&storing_data[i].number_of_student);
    printf("\n");

    }
/***************output section**************/
    printf("\t \t \t \t \t \t***COLLEGE DETAILS*** \n");
    printf("\n");

printf("College code :");
printf("%s \n",entry1.college_code);
printf("\n");

printf("College name :");
printf("%s \n",entry1.college_name);
printf("\n");

printf("Year of establishement :");
printf("%s\n",entry1.college_estyear);
printf("\n");

printf("Number of courses in college :");
printf("%d\n",entry1.number_courses);
printf("\n");

printf("\t \t \t \t \t \t***COURSE DETAILS*** \n");
printf("\n");
    for(int j=0;j<temp;j++)
    {
printf("%d] ",j+1);
printf("\nCourse name :");
printf("%s",storing_data[j].course_name);

printf("\nCourse duration :");
printf("%0.1f",storing_data[j].course_duration);

printf("\nNumber of students :");
printf("%d",storing_data[j].number_of_student);
    printf("\n \n ");
    }
    return 0;
}
```

Time Complexity



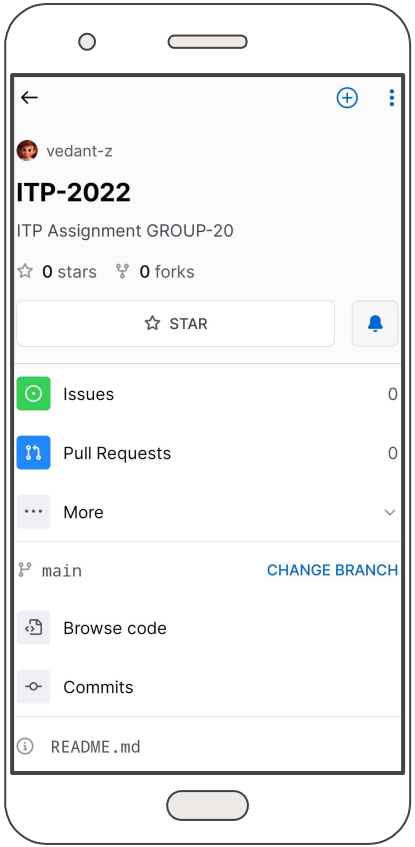
Space Complexity



Mobile project

Access the GitHub project through GitHub mobile app.

https://github.com/vedant-z/ITP-2022



Extra Resources

https://www.geeksforgeeks.org/structures-in-cpp/?ref=lbp

https://www.geeksforgeeks.org/array-of-structures-vs-array-within-a-structure-in-c-and-cpp/

https://stackoverflow.com/questions/30619085/error-in-getting-input-in-structure-using-gets

Thanks!

Submitted by:

IEC2021079 Vedant Borkar
IEC2021080 N.Pooja
IEC2021081 Ashutosh Shah
IEC2021082 Neha Meena